Federal Aviation Administration

Memorandum

Date: July 7, 2009

To: Manager, Transport Airplane Directorate International Branch, ANM-116

From: Manager, Transport Standards Staff, Airframe/Cabin Safety, ANM-115

Prepared by: Vladimir Ulyanov, Airbus A330 and A340 aircraft Project Manager, ANM-116

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Airbus project on Models A330-200/-300, A340-200/-300, A340-500/-600, FAA Project # TD0609IB-T

ELOS Memo#: TD0609IB-T-CI-5

Regulatory Ref: §§ 21.21(b)(1), 25.856(b), 121.312(e)(3)

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate on the establishment of an equivalent level of safety finding for the Airbus Models A330-200/-300, A340-200/-300, A340-500/-600.

Background

Amendment 25-111 was adopted in July 2003, to raise the level of fire safety on transport category airplanes both from an in-flight and post-crash standpoint. With respect to post-crash fire safety, the new requirements involve a stringent test method for thermal/acoustic insulation installed in the lower half of the fuselage. This requirement is implemented for newly manufactured airplanes in U.S. air carrier operations by concurrent Amendment 121-301. The intent of the requirement is to provide an additional barrier between the occupants and a post-crash fire, that will extend the time available for evacuation. The rule applies to the thermal/acoustic insulation that is installed, but does not require the installation of insulation. Since transport category airplanes are generally insulated in the lower half, the FAA considered that this approach was appropriate. However, the rulemaking also noted that if insulation were to be removed to avoid compliance, the issue of whether to require insulation in the lower half of the fuselage would be revisited. The preamble to the regulation also acknowledged that other methods of achieving the objective would be entertained using the equivalent level of safety provisions of Title 14 Code of Federal Regulation (14 CFR) section 21.21.(b)(1).

Applicable regulation(s)

§§ 21.21(b)(1), 25.856(b), 121.312(e)(3).

Regulation(s) requiring an ELOS finding

§ 25.856(b)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

Certain Airbus airplanes incorporate a carbon fiber aft pressure bulkhead. The insulation on the aft pressure bulkhead does not comply with the requirements of § 25.856(b), however, the bulkhead itself does. Airbus has proposed an alternative method under the equivalent level of safety provisions of § 21.21 (b)(1).

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

The composite pressure bulkhead provides surface protection in the upper and lower half of the fuselage, while the rule requires a fire barrier only in the lower half. The protection provided in terms of crash fire protection is therefore locally increased compared to the requirements of § 25.856(b). It is also clear that the composite pressure bulkhead will stay in the airplane. Where § 25.856(b) applies - the modification of insulation materials and the installation of the existing composite pressure bulkhead will not increase the fire penetration resistance of the passenger compartment, in terms of § 25.856(b).

The pressure bulkhead is made of carbon fiber reinforced plastic (CFRP), minimum thickness 3mm, and is burn through resistant according to Appendix F, part VII.

It is also a permanent, continuous barrier that spans beyond the required area of the fuselage and provides an equivalent level of safety to that required by § 25.856(b).

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned equivalent level of safety finding in project issue paper (IP) CI-5 titled "Fuselage Burnthrough Substantiation for aft pressure bulkhead". This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Transport Airplane Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet

under the Certification Basis section (TCs & ATCs) or in the Limitations and Conditions Section of the STC Certificate in accordance with the statement below:

Equivalent Level of Safety Findings have been made for the following regulation(s): 14 CFR part 25.856(b), Improved Flammability standards for Thermal/acoustic insulation materials (documented in TAD ELOS Memo TD0609IB-T-CI-5).

for Franklin Hangsy
Manager, Transport Airplane Directorate,
Aircraft Certification Service

7/7/09
Date

ELOS Originated by TAD:	Project Engineer: Vladimir Ulyanov	Routing Symbol ANM-116